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I, LEANNE MYNOTT, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003906385 for a patent by TRACME BEACONS PTY LTD as filed on 19 November 2003.



WITNESS my hand this
Eighth day of December 2004

A handwritten signature in black ink, appearing to be 'L. Mynott'.

LEANNE MYNOTT
MANAGER EXAMINATION SUPPORT
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AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION

Invention Title: Personal Locator Beacon

The invention is described in the following statement:

Title of Invention: Personal Locator Beacon

Field of Invention:

5 This invention relates to beacons for alerting and assistance in the location of persons lost or in distress. In particular it relates to an electronic radio-frequency locator beacon suitable for personal use.

10 **Background of the Invention:**

Emergency location devices, such as emergency position indicating radio beacons ("EPIRBs") and emergency personal locators ("EPLs") are well known in the art. When activated, such devices usually transmit a code or similar signal on a standard
15 international search and rescue radio frequency for homing radio direction finding.

An inherent shortcoming of these systems is the high transmit power needed to operate the integral transmitter. For these transmitters to be powered for reliable use, the associated battery must be capable of operation over an extended period.
20 Since these devices must be capable of relatively high-power transmission, the batteries needed to power the devices are necessarily large; thus the overall device generally is large and therefore cumbersome. In addition, the devices require sufficient operating life to ensure the location of a user in distress. Devices exist which address some but not all of the requirements for a rugged, small, light weight,
25 reliable, low power emergency-alerting device capable of transmitting a radio frequency signal.

Summary of the Invention:

30 This invention accordingly provides a personal locator beacon having:
 an inner case which includes a radio-frequency signal transmitter and transmission activation means;

an outer case adapted to at least partially enclose the inner case and operatively engaged with the transmission activation means;

whereas, in use, the removal of the inner case from the outer case activates the transmission activation means causing the transmission of a radio-frequency signal.

5

Preferred Aspects of the Invention:

It is preferred that the beacon is configured and constructed in such a way that the removal of the inner case (and hence the activation of the beacon) can be effected by a one-handed operation.

10

It is further preferred that the radio-frequency signal that is transmitted is a voice transmission, particularly in the UHF CB transmission band. The preferred voice transmission is the repetition of the word "mayday".

15

The inner case may include a microprocessor and a programmable voice memory unit that is able to provide a variety of voice messages. In addition to the voice message, the transmission may include a digital code such as a specific identifier for the beacon.

20

It is further preferred that the outer case includes a clip that is adapted to attach the beacon to a user's person such as by attachment to clothing, belt or harness.

25

The inner case may be attached to the outer case by means of a flexible attachment, such as a thread. By this means the inner case, once the beacon is activated, can remain attached to the person via the outer case and clip. The flexible attachment may be frangible so that the inner case can be detached if desired in suitable circumstances.

30

Whilst the beacon may have an internal antenna within the inner case, it is preferred that the antenna is a flexible external straight wire antenna attached to the inner case, which deploys when the unit is activated.

A specific embodiment in accordance with this invention will now be described by way of an example thereof with reference to the accompanying drawings.

5 Brief Description of the Views of the Drawings:

Figure 1 is a perspective view of a personal locator beacon according to the invention.

10 Figure 2 is a perspective view of the beacon of Figure 1 shown in its activated state.

Figure 3 is a simple functional block diagram of the beacon.

15 Figure 4 is a flow chart showing the electronic operation of the beacon when activated.

Figure 5 is a flow chart showing the electronic operation of a test button of the beacon.

20 Detailed Description with Respect to the Drawings:

A personal locator beacon (1) according to the invention is illustrated in Figures 1 and 2.

25 An inner case (2), of injection moulded plastic, contains a battery power supply (3), a microprocessor (4) a radio-frequency signal transmitter (5) and an antenna (6). Included with the microprocessor is a programmable voice memory unit (7) and an activation mechanism (8). This arrangement is shown schematically in Figure 3.

30 An outer case (9) acts as a holder for the inner case and includes a clip (10) by which the beacon can be attached conveniently to a user. When the inner case is removed from the outer case (such as by the user gripping it with two fingers and pulling it down and outwards) the activation mechanism is tripped and the beacon

will begin to transmit its pre-programmed signal. This arrangement allows single-handed operation of the beacon.

5 If the inner case is returned to the outer case within 15 seconds, as may happen if the unit is activated accidentally, then the unit is deactivated and ready for use again. If the unit remains activated for more than 15 seconds, then it will continue to operate until it is deactivated permanently.

10 A thread (11) attaches the inner case to the outer case so that the entire unit remains attached to the user by the clip. This arrangement is desirable in certain uses, such as in climbing, so that the inner case does not drop away from the user. However, the thread is frangible so that it can be broken, such as with a firm pull by the user, to separate the inner case. This might be desirable if the beacon is to be set up in an open position while the user seeks shelter nearby.

15 The radio transmitter is tuned to operate on a designated public emergency channel in the UHF CB frequency band and the voice memory unit is programmed to transmit the message "mayday" approximately every 15 seconds. For those reasons, there is no special receiving equipment required to detect and understand
20 the beacon's transmission. A commonly used CB radio receiver or transceiver is all that is required (however, a directional antenna would be helpful in locating the beacon).

25 If required, the voice memory unit can be programmed to generate a more specific voice message, such as "man overboard". In addition to the voice message, a digital code could be generated; for example as a specific code to identify the particular beacon.

30 The battery power supply is of a standard long-life, light-weight type, as is known in the art, and is adapted to power the activated transmitter for approximately 160 hours of continuous use. The battery has a shelf life of at least 10 years.

The electronic operation of the beacon when activated is shown schematically in the flow chart of Figure 4.

With such a structure and composition as described above, the beacon has a weight of approximately 35 grams and dimensions of approximately 2cm x 3cm x 5cm (H x W x D). As such, the device is adapted to be conveniently and readily worn
5 attached to the body of a user; such as attached to a belt or button-hole by the clip on the outer case.

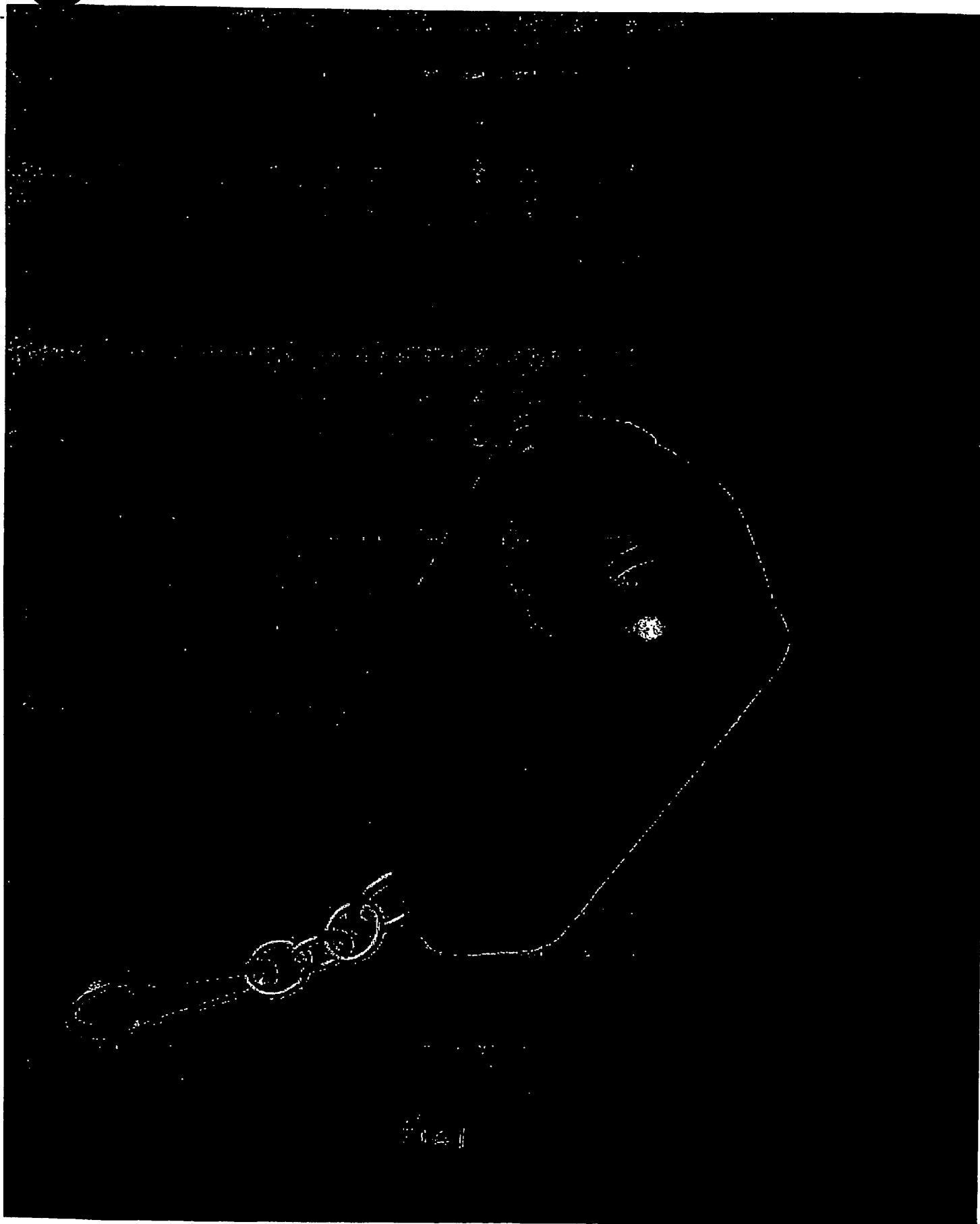
Generally, beacons of the prior art can be used and re-used at any time, thus there can be no assurance of the duration of operation of the beacon, once activated.
10 Conversely, the beacon of the present invention, being a single-use device, discourages a user from "trying it out". This ensures that for the entire life of the unit, the battery is fully charged ready for the time when the beacon is required in an emergency. The single-use nature of the beacon also reduces the required maintenance of the unit to zero.

As is illustrated in Figure 5, the inner case of the beacon can be fitted with a simple test button to send a single pulse to a visual indicator. However, because there are no activating buttons or controls on the outer surface of the outer case, the
15 possibility of false activations is reduced.

Finally it is to be understood that various alterations, modifications and or additions may be incorporated into the various constructions and arrangements of parts described herein without departing from the spirit and ambit of the invention.
20

Tracme Beacons Pty Ltd
By their Patent Attorneys
Pipers

25
30 Dated: - 19 November 2003



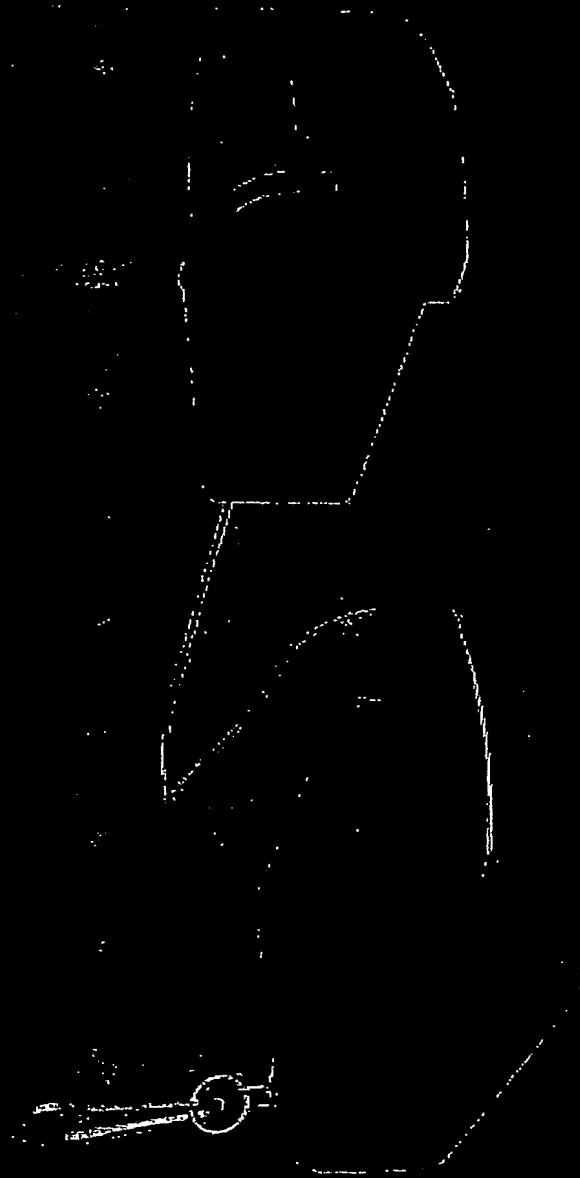


FIG 2

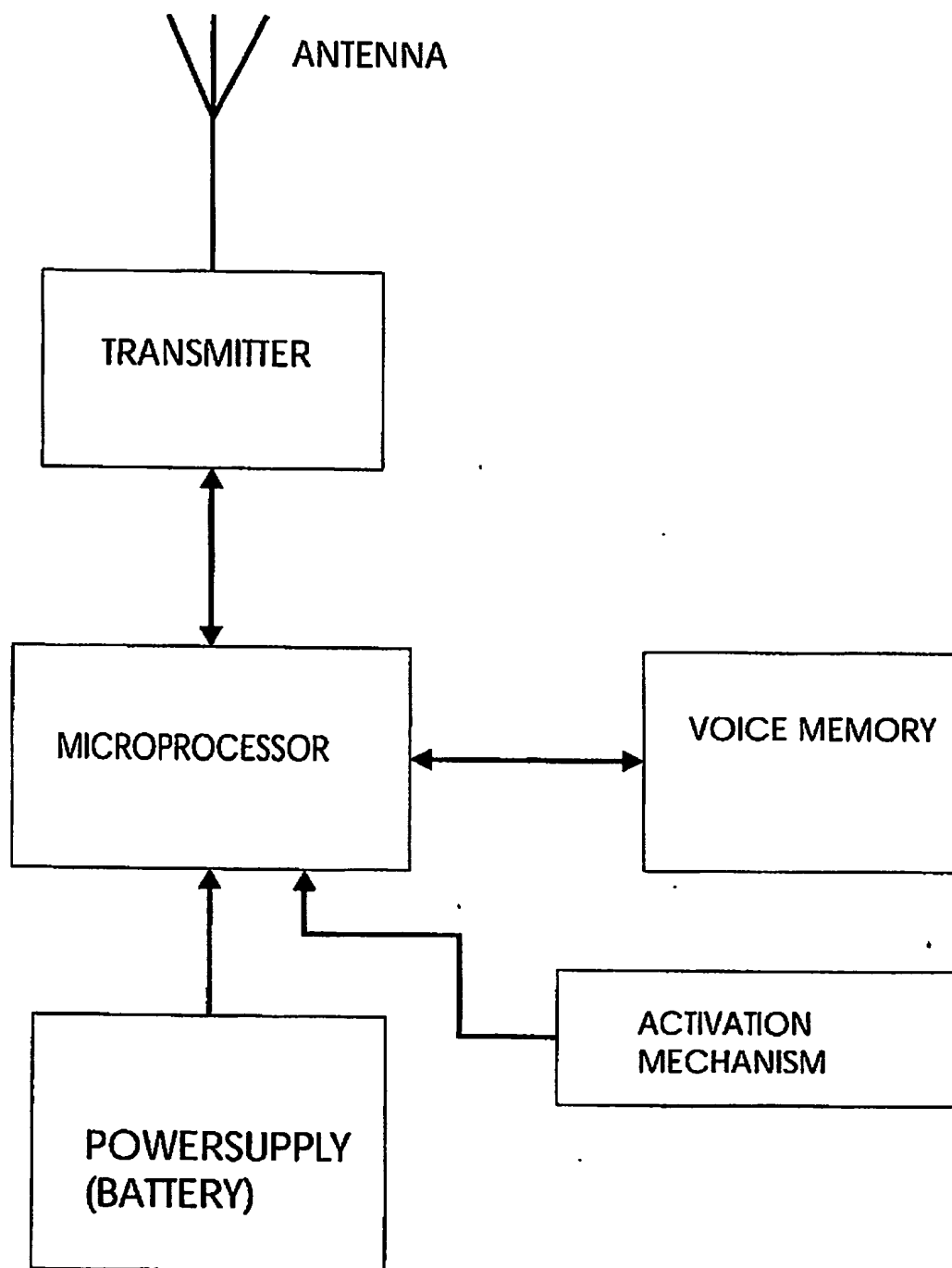


Fig 3 TRACME PLB FUNCTIONAL BLOCK DIAGRAM

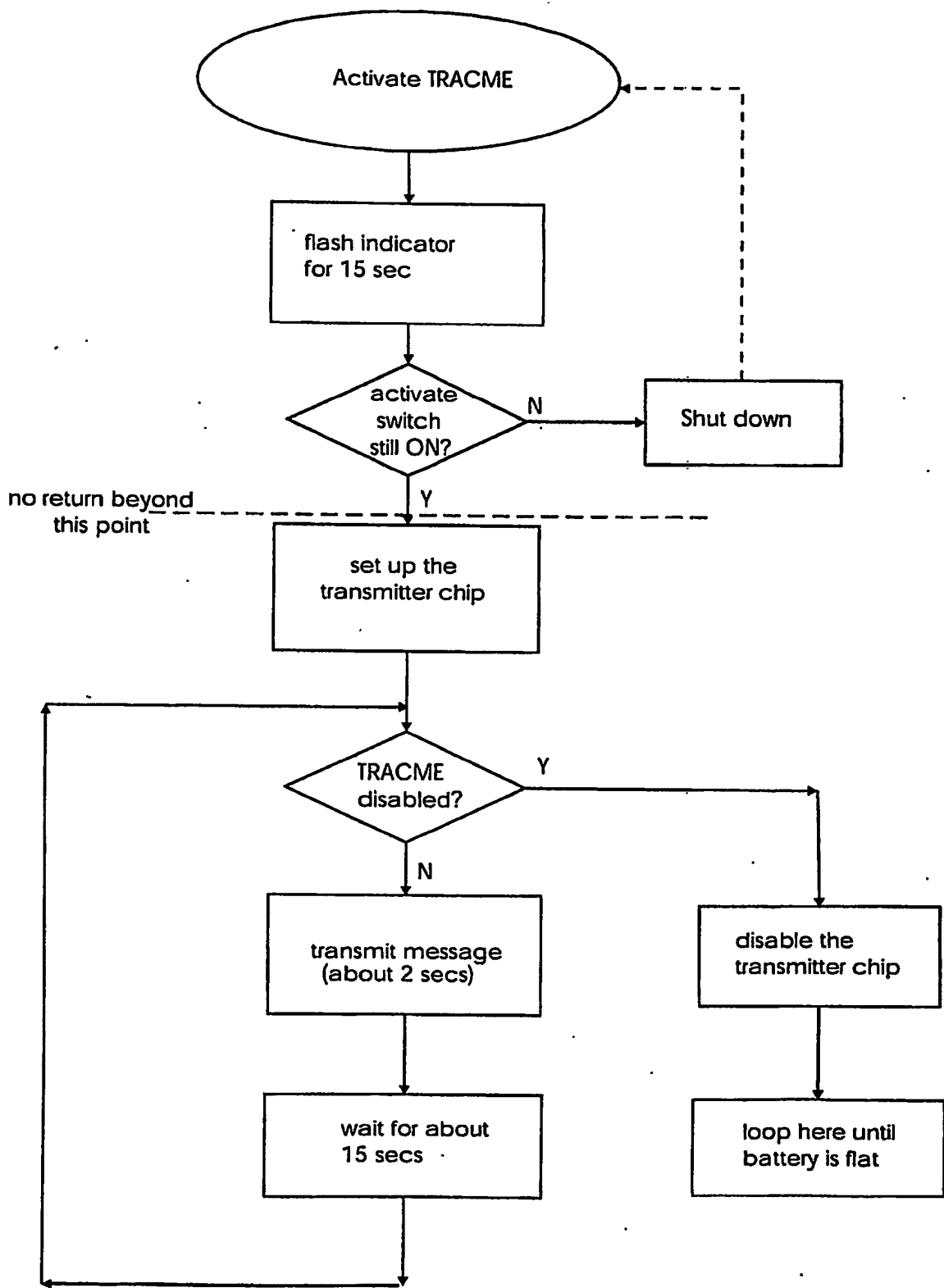


FIG4 Flow chart showing TRACME operation when activated

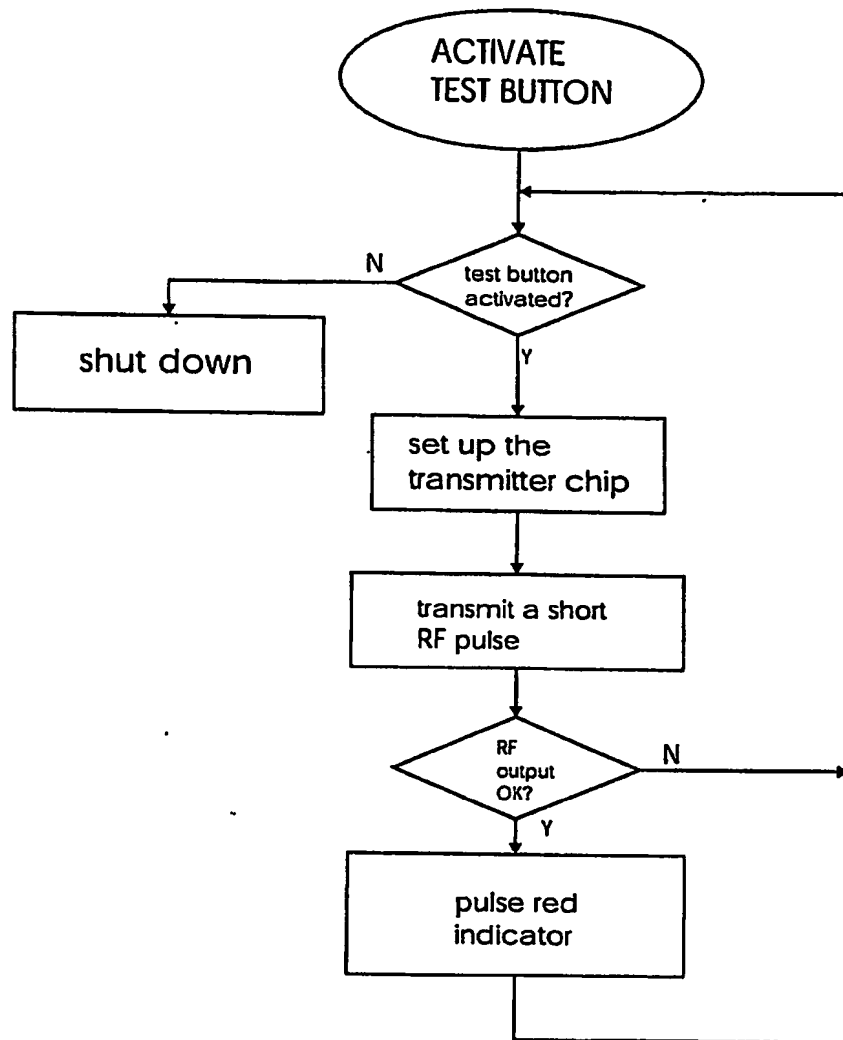


FIG 5 Flow chart for Test button activation

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